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**Printer driver in information processor - alters printing procedure when
detected number of papers is below predetermined number**

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Abstract (Basic): JP 11034410 A

NOVELTY - The number of pages of the document is detected. Then the number of papers is detected based on layout information of document. When the detected number of papers is below predetermined number, printing procedure is altered.

USE - None given.

ADVANTAGE - The printer driver can perform optimum printing process depending on the number of sheets of printing document. DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of the printing system.

Dwg.1/3

Title Terms: PRINT; DRIVE; INFORMATION; PROCESSOR; ALTER; PRINT; PROCEDURE;
DETECT; NUMBER; PAPER; BELOW; PREDETERMINED; NUMBER

Derwent Class: P75; T01; T04

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【特許請求の範囲】

【請求項1】 情報処理装置に搭載され、該情報処理装置に接続されたプリンタを制御して印刷文書を出力するプリンタドライバにおいて、

前記出力される印刷文書のページ数を検知する手順と、
該検知されたページ数から出力される紙数を検知する手順と、

該検知された紙数が所定紙数以下である場合に印刷に関する指示の方法を変更する手順と、
を備えたことを特徴とするプリンタドライバ。

【請求項2】 前記所定紙数が1枚であることを特徴とする請求項1に記載のプリンタドライバ。

【請求項3】 前記印刷に関する指示の方法の変更は、検知された紙数が所定紙数以下であるとき、所定紙数分の前記印刷文書データを複数回送る方法から、複数枚分のコピー指示を送った後、所定紙数分の前記印刷文書データを送る方法への変更であることを特徴とする請求項1または2に記載のプリンタドライバ。

【請求項4】 前記紙数の検知は、検知されたページ数と、前記印刷文書の両面印刷指定の有無と、印刷文書のレイアウト情報とに基づいて行なわれることを特徴とする請求項1から3までのいずれか1項に記載のプリンタドライバ。

【請求項5】 情報処理装置に接続され、該情報処理装置に搭載されたプリンタドライバに制御されて印刷文書を出力するプリンタにおいて、

前記プリンタドライバが、
前記出力される印刷文書のページ数を検知する手順と、
該検知されたページ数から出力される紙数を検知する手順と、

該検知された紙数が所定紙数以下である場合に印刷に関する指示の方法を変更する手順と、
を備えていることを特徴とするプリンタ。

【請求項6】 情報処理装置およびプリンタを備え、前記情報処理装置に搭載されたプリンタドライバに制御されて前記プリンタが印刷文書を出力する印刷システムにおいて、

前記プリンタドライバが、
前記出力される印刷文書のページ数を検知する手順と、
該検知されたページ数から出力される紙数を検知する手順と、

該検知された紙数が所定紙数以下である場合に印刷に関する指示の方法を変更する手順と、
を備えていることを特徴とする印刷システム。

【請求項7】 プリンタドライバを搭載し、該プリンタドライバによってプリンタを制御して印刷文書を出力する情報処理装置において、

前記プリンタドライバが、
前記出力される印刷文書のページ数を検知する手順と、
該検知されたページ数から出力される紙数を検知する手

順と、

該検知された紙数が所定紙数以下である場合に印刷に関する指示の方法を変更する手順と、

を備えていることを特徴とする情報処理装置。

【請求項8】 プリンタドライバによって制御されるプリンタにより印刷文書を印刷する印刷方法において、
前記プリンタドライバが、

前記出力される印刷文書のページ数を検知する手順と、
該検知されたページ数から出力される紙数を検知する手順と、

該検知された紙数が所定紙数以下である場合に印刷に関する指示の方法を変更する手順と、

を備えていることを特徴とする印刷方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、プリンタドライバ、プリンタ、印刷システム、情報処理装置および印刷方法、さらに詳細には、情報処理装置に搭載され、該情報処理装置に接続されたプリンタを制御して印刷文書を出力するプリンタドライバ並びにこのプリンタドライバによって制御されるプリンタ、印刷システム、情報処理装置およびこのプリンタドライバを使用した印刷方法に関する。

【0002】

【従来の技術】印刷処理方式の中に、数ページにわたる文書を何部かに印刷するときに、1部目を最終ページまで印刷してから2部目を印刷する、いわゆる部単位印刷が知られている。このような部単位印刷を行なうかは、ユーザが設定し、部単位印刷を行なう場合には、プリンタドライバ側で部数分のデータをプリンタに出力し、一方部単位印刷を行わない場合には、一部分のデータのみをプリンタ側に出力し、プリンタ側のコピー指定を部数分設定することにより複数部のコピーをプリンタに実行させている。

【0003】

【発明が解決しようとする課題】しかしながら、従来のプリンタ制御では、印刷文書が1枚であるにもかかわらず、プリンタドライバのユーザ設定に部単位印刷が設定されていると、プリンタドライバは部数分のデータをプリンタに出力し、印刷装置は指示に従って部数分のデータ解析処理を実行していた。この解析処理は、処理時間を必要とされるためこの処理を重複して行なうことは、時間的なロスが大きく、印刷処理を行なう上で効率的ではなかった。

【0004】このように、印刷文書の枚数が印刷するまで不明の印刷アプリケーションでは、プリンタドライバは部単位印刷をプリンタドライバ側で行なうべきか、プリンタ側のコピー機能で行なうべきかは分からず、ユーザ設定に従って行なわれることになるので、最適な印刷処理をすることができないという問題が生じていた。

【0005】本発明の課題は、上記問題点を解決するためになされたもので、印刷文書の枚数（紙数）に応じて最適な印刷処理を実行できるプリンタドライバ、プリンタ、印刷システム、情報処理装置および印刷方法を提供することである。

【0006】

【課題を解決するための手段】以上の課題を解決するために、本発明においては、情報処理装置に搭載され、該情報処理装置に接続されたプリンタを制御して印刷文書を出力するプリンタドライバにおいて、前記出力される印刷文書のページ数を検知する手順と、該検知されたページ数から出力される紙数を検知する手順と、該検知された紙数が所定紙数以下である場合に印刷に関する指示の方法を変更する手順とを備えた構成を採用している。

【0007】このような構成では、出力される印刷文書のページ数に基づいて検知される紙数が所定紙数以下である場合には、印刷に関する指示の方法が変更される。例えば、所定紙数が1枚である場合には、1枚分の印刷文書データを複数回送する方法から、複数枚分のコピー指示を送った後、1枚分の印刷文書データを送る方法へと変更される。従って、部単位印刷が指示されていても、印刷文書が所定紙数以下の場合には、所定紙数分のみの印刷文書データがプリンタに出力され、部数分の印刷は、プリンタ側のコピー処理により行なわれる。従って、全体の印刷時間の短縮をはかることができる。

【0008】印刷文書の紙数は、検知されたページ数と、印刷文書の両面印刷指定の有無と、印刷文書のレイアウト情報とに基づいて検知される。

【0009】また、本発明では、情報処理装置に接続され、該情報処理装置に搭載されたプリンタドライバに制御されて印刷文書を出力するプリンタにおいて、プリンタドライバが上記構成を有することを特徴としている。

【0010】さらに、本発明では、情報処理装置およびプリンタを備え、前記情報処理装置に搭載されたプリンタドライバに制御されて前記プリンタが印刷文書を出力する印刷システムにおいて、プリンタドライバが上記構成を有することを特徴としている。

【0011】また、本発明では、プリンタドライバを搭載し、該プリンタドライバによってプリンタを制御して印刷文書を出力する情報処理装置において、プリンタドライバが上記構成を有することを特徴としている。

【0012】さらに本発明では、プリンタドライバによって制御されるプリンタにより印刷文書を印刷する印刷方法において、プリンタドライバが上記構成を有することを特徴としている。

【0013】

【発明の実施の形態】以下、図面に示す実施の形態に基づき、本発明を詳細に説明する。

【0014】〔第1の実施形態〕図1は、第1の実施形態に係わるプリンタドライバが適用された印刷システム

の構成を示すブロック図である。同図において、符号1で示すものは、コンピュータ端末であり、このコンピュータ端末1は、全体の制御を司るコンピュータ端末CPU1a、プログラム及び種々のデータを格納するメモリ1b、表示装置1c、固定ディスク装置1d、取り外し可能なディスクドライブ1e、システムクロック1fから構成されている。

【0015】また、符号2で示すプリンタは、プリンタ制御用のプリンタCPU2a、展開メモリ2b、印刷を実行する印刷ユニット2c、受信メモリ2dから構成される。3はセントロニクスインターフェースを示し、コンピュータ端末1はセントロニクスインターフェース3を介してプリンタ2と接続される。

【0016】プリンタドライバは、固定ディスク装置1d上からメモリ1bに読み込まれ、CPU1aの制御のもとに動作して、印刷アプリケーションによって印刷が指示されたデータをプリンタ2が解釈できるプリンタ言語に変換する。この変換されたプリンタ言語は一旦固定ディスク1d上にスプールされる。印刷時には、印刷データがプリンタ2に送信され、受信メモリ2dに格納され、プリンタCPU2aの制御のもとに画像データに展開された後、展開メモリ2bに格納され、印刷ユニット2cにより印刷が行なわれる。

【0017】また、コンピュータ端末1の上で動作しているプリンタドライバによってコピー枚数が指示されると、プリンタ2は展開メモリ2b上の画像データを印刷ユニット2cにコピー枚数分出力し、コピー印刷を実行する。

【0018】図2には、コンピュータ端末1で動作するプリンタドライバによって実行される印刷処理ルーチンがフローチャートの形で図示されている。

【0019】まず、印刷の指示が有るとプリンタでの印刷の準備をするために公知の初期化処理を行なう。即ち、印刷文書の全ページ数を記憶するプリンタドライバの内部変数pageを値0とし、印刷文書の1枚を構成するページ数を記憶するプリンタドライバの内部変数page_of_sheetを値1に初期化する（ステップS201）。ここで、page_of_sheetとは、印刷用紙1枚あたりに印刷される印刷ページ数を意味し、例えば、両面印刷のように印刷用紙1枚あたりに2ページが印刷される場合は、値2となる。

【0020】次に、コンピュータ端末1の上で印刷アプリケーションによって印刷が指示された印刷データをプリンタ2が解釈できるプリンタ言語に変換する（ステップS202）。

【0021】1ページ分のデータがプリンタ言語に変換されたか否かを判別し（ステップS203）、1ページ分のデータがプリンタ言語に変換されているとき、プリンタドライバ内部変数pageの値をインクリメントする（ステップS204）。S203で1ページ分のプリ

ンタ言語の変換を終了していないと判別されたときは、そのページ分のプリンタ言語への変換処理を継続するため、ステップS202に戻る。ステップS202およびステップS203で変換されたプリンタ言語を固定ディスク装置1d上のファイルにスプールする(ステップS205)。

【0022】この処理を各ページごとに行ない、全ページについてプリンタ言語に変換したか否かを判別する(ステップS206)。全ページについて作成処理が終了していない場合には、ステップS202に戻り、上記処理を繰り返す。一方、全ページについて処理が終了している場合には、プリンタドライバの設定が部単位印刷になっているか否かを判別する(ステップS207)。

【0023】ステップS207で、部単位印刷が設定されていると判断されたときには、両面印刷が設定されているか否かを判断する(ステップS208)。両面印刷が設定されていれば、プリンタドライバ内部変数page_of_sheetの値を2に設定する(ステップS209)。

【0024】さらに、レイアウト印刷の設定内容を判別し(ステップS210)、2in1印刷ならプリンタドライバ内部変数page_of_sheetの値を2倍し(ステップS211)、4in1印刷ならプリンタドライバ内部変数page_of_sheetの値を4倍する(ステップS212)。ここで、2in1印刷とは1枚の印刷用紙に2ページ分をレイアウトして印刷をする場合をいい、4in1印刷とは1枚の印刷用紙に4ページ分をレイアウトして印刷することをいう。

【0025】次に、プリンタドライバの内部変数pageの値をプリンタドライバの内部変数page_of_sheetの値で割り、全印刷枚数(紙数)を計算する(ステップS213)。端数が出る場合には、小数点以下を切り上げて1枚として計算する。例えば、両面印刷をする場合には、page_of_sheetの値が2となるため、印刷ページ数の2分の1の枚数が、全印刷枚数となる。

【0026】ここで、全印刷枚数が1枚か否かを判別する(ステップS214)。値が1でないとき、すなわち、全印刷枚数が2枚以上である場合は、固定ディスク装置1d上にスプールされたプリンタ言語を部数回分セントロニクスインターフェース3を介してプリンタ2に出力する(ステップS215)。

【0027】一方、ステップS207で部単位印刷が設定されていないか、ステップS214で印刷枚数が値1であるときには、固定ディスク装置1d上のファイルにスプールされたプリンタ言語を1回分だけ、セントロニクスインターフェース3を介してプリンタ2に出力する(ステップS216)。ステップS216でコピー枚数が指示されると、展開メモリ2b上の画像データが印刷ユニット2cにコピー枚数分出力され、コピー印刷が実

行される。すなわち、全印刷枚数が1枚である場合には、部単位印刷が設定されていても、固定ディスク装置1d上のファイルにスプールされたプリンタ言語が1回分だけしか、プリンタ2に出力されず、プリンタのコピー処理により必要部数が印刷されることになる。

【0028】[第2の実施形態]図3には、第2の実施形態に係わるプリンタドライバによる処理の流れが図示されている。この実施形態のプリンタドライバが適用される印刷システムの構成は、第1の実施形態のものと同一である。

【0029】図3において、まず、第1の実施形態と同様にプリンタドライバ内部変数pageを値0に、プリンタドライバ内部変数page_of_sheetを値1に初期化する(ステップS301)。

【0030】次に、両面印刷が設定されているか否かを判断し(ステップS302)、設定されていればプリンタドライバ内部変数page_of_sheetの値を2に設定する(ステップS303)。さらに、レイアウト印刷の設定内容を判別し(ステップS304)、2in1印刷ならプリンタドライバ内部変数page_of_sheetの値を2倍し(ステップS305)、4in1印刷ならプリンタドライバ内部変数page_of_sheetの値を4倍する(ステップS306)。

【0031】次に、コンピュータ端末1の上で印刷アプリケーションから印刷が指示されたデータをプリンタ2が解釈できるプリンタ言語に変換し(ステップS307)、1ページ分のデータがプリンタ言語に変換されたか否かを判別する(ステップS308)。1ページ分のデータがプリンタ言語に変換されているときには、プリンタドライバ内部変数pageの値をインクリメントする(ステップS309)。ステップS308で1ページ分のプリンタ言語の変換を終了していないと判別されたときには、ステップS307に戻り、その変換を継続する。

【0032】上記ステップS309でpage変数がインクリメントされた後、ステップS307で変換されたプリンタ言語を固定ディスク装置1d上のファイルにスプールする(ステップS310)。次に、全ページがプリンタ言語に変換されたか否かを判別し(ステップS311)、全ページ分プリンタ言語に変換されていないとき、ステップS307に戻り、上記処理を繰り返す。

【0033】ステップS311で、全ページがプリンタ言語に変換されたと判断された場合には、プリンタドライバの設定が部単位印刷になっているか否かを判別し(ステップS312)、部単位印刷が設定されているときには、プリンタドライバ内部変数pageとプリンタドライバ内部変数page_of_sheetの値とを比較する(ステップS313)。両変数が等しいか、全印刷ページ数の方が小さい場合には、コピー枚数設定コマンドを用いてコピー部数を設定し、変換された全印刷

ページのプリンタ言語をセントロニクスインターフェース3を介してプリンタ2に出力し、印刷を実行する(ステップS314)。ここで、プリンタ2は展開メモリ2b上の画像データを印刷ユニット2cに指示されたコピー枚数分出力し、コピー印刷を実行する。

【0034】一方、ステップS313で、全印刷ページ数のほうが大きいと判断されたときには、変換された全印刷ページのプリンタ言語をセントロニクスインターフェース3を介してプリンタ2に部数回出力してプリンタ2に印刷を指示する(ステップS315)。

【0035】なお、ステップS312で部単位印刷に設定されていないとき、ステップS314に移行し、上記処理を行なう。

【0036】なお、上記第1と第2の実施形態において、プリンタドライバとプリンタとの接続は、セントロニクスインターフェースを介して行なったが、RS232C等のシリアルインターフェイスであっても構わないし、またイーサネットのようなネットワーク接続であってもよい。

【0037】また、2in1印刷あるいは4in1印刷の処理は、プリンタドライバ側で行ってもプリンタ側で行ってもよい。

【0038】さらに、コンピュータ端末がプリンタと双方向インターフェースを介して接続される場合には、プリンタに対して能力を確認し、プリンタ側で部単位印刷機能を有しているか否かによって、本発明の処理を行うか否かを判定しても構わない。

【0039】本発明に使用するプリンタは、紙単位のコピー印刷機能を有していれば、レーザビームプリンタ、インクジェットプリンタ、熱転写プリンタ、ドットインパクトプリンタなどどのようなプリンタであっても構わない。

【0040】

【発明の効果】以上から明らかなように、本発明では、出力される紙数が所定紙数以下であると判断された場合には、印刷に関する指示の方法が変更されるので、印刷文書のページ数および紙数が印刷するまで不明の印刷アプリケーションでも、出力される紙数に応じて適切な印刷指示を行なうことができ、印刷処理を向上させること

ができる。

【0041】紙数が所定値以下の場合、例えば、所定紙数が1枚である場合には、1枚分の印刷文書データを複数回送る方法から、複数枚分のコピー指示を送った後、1枚分の印刷文書データを送る方法へと変更される。従って、部単位印刷が指示されていても、所定紙数分のみの印刷文書データがプリンタに出力され、部数分の印刷は、プリンタ側のコピー処理により行なわれるので、全体の印刷処理時間の短縮をはかることができる。

【0042】また、印刷文書の紙数の検知は、検知されたページ数と、印刷文書の両面印刷指定の有無と、印刷文書のレイアウト情報とに基づいて行なわれるので、簡単な構成で紙数を検知することができる。

【0043】さらに、本発明のプリンタ、印刷システム、情報処理装置および印刷方法では、上記プリンタドライバが採用されるので、同様の優れた作用効果を奏することができる。

【図面の簡単な説明】

【図1】プリンタドライバが適用された印刷システムの構成を示すブロック図である。

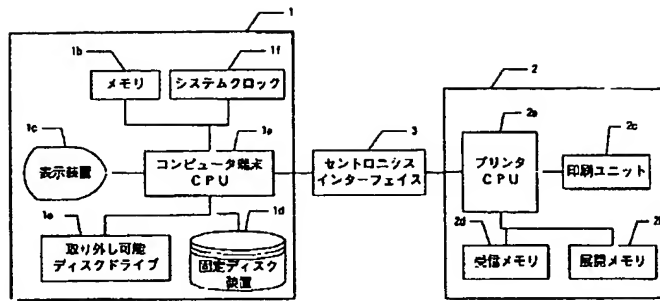
【図2】コンピュータ端末で動作する第1の実施形態に係わるプリンタドライバによって実行される印刷処理ルーチンを示すフローチャートである。

【図3】コンピュータ端末で動作する第2の実施形態に係わるプリンタドライバによって実行される印刷処理ルーチンを示すフローチャートである。

【符号の説明】

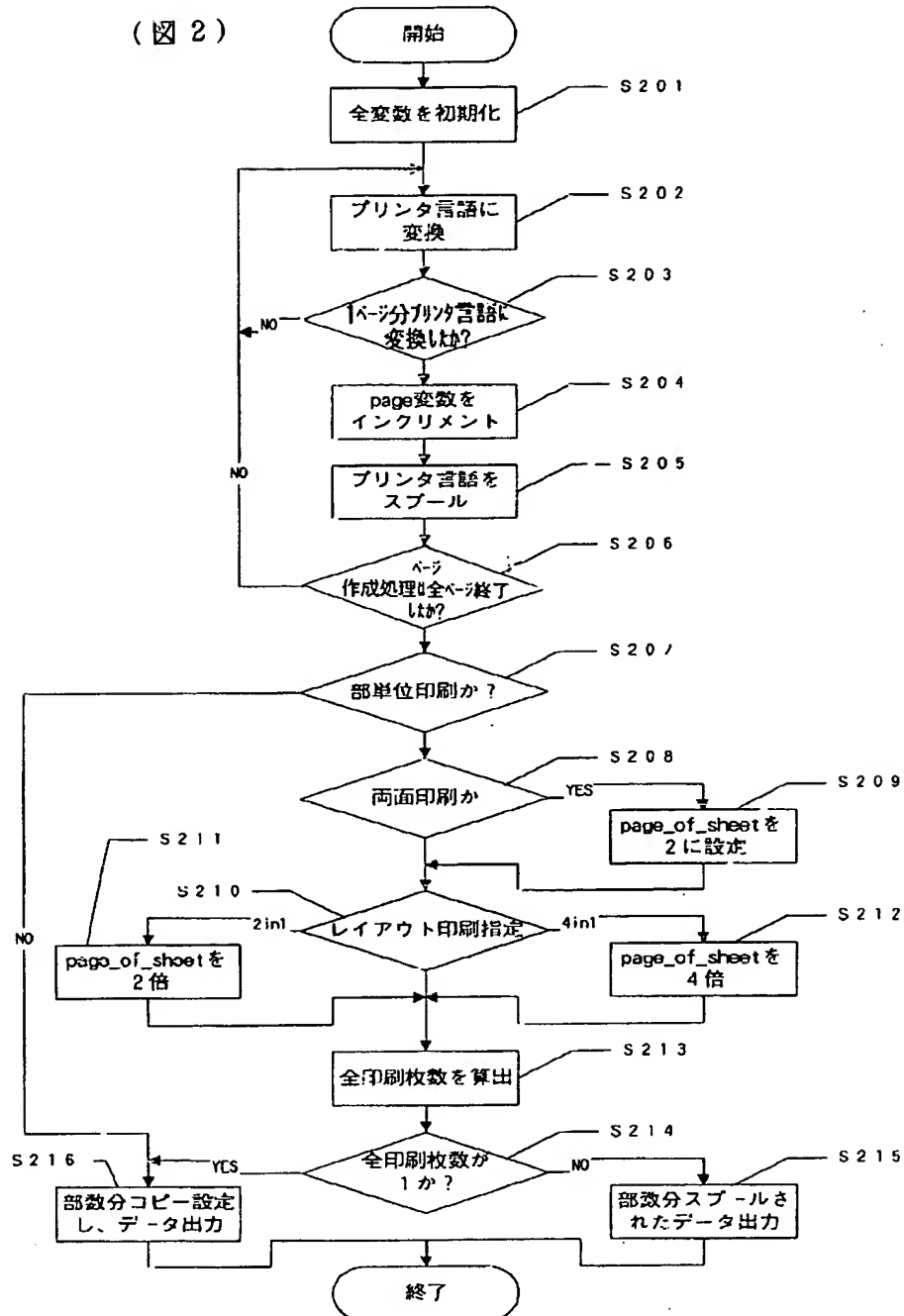
- 1 コンピュータ端末
- 1a コンピュータ端末CPU
- 1b メモリ
- 1c 表示装置
- 1d 固定ディスク装置
- 1f システムロック
- 2 プリンタ
- 2a プリンタCPU
- 2b 展開メモリ
- 2c 印刷ユニット
- 2d 受信メモリ

【図1】

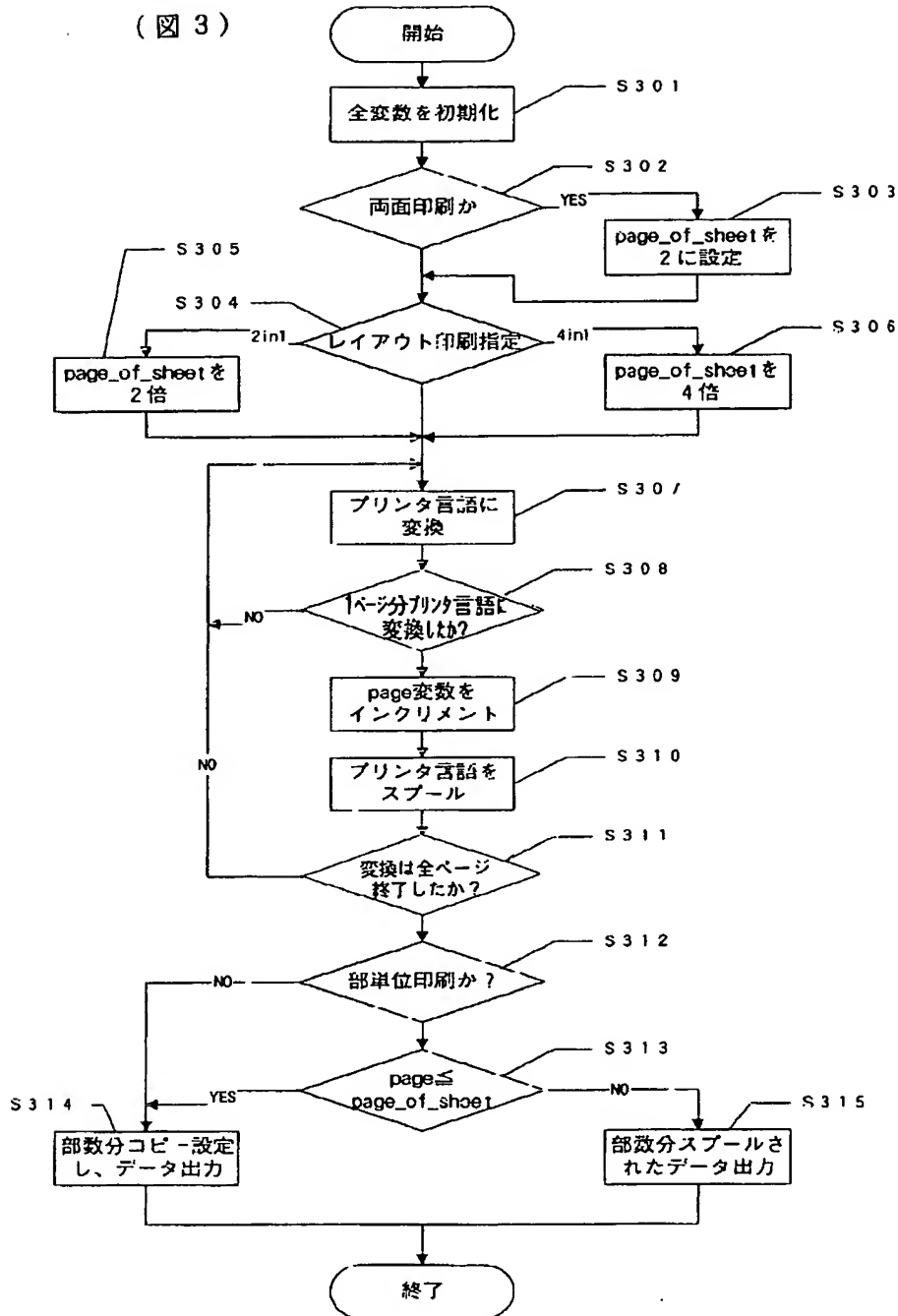


(図 1)

【図2】



【図3】



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CLAIMS

[Claim(s)]

[Claim 1] The printer driver characterized by to have the procedure which detects the pagination of said printing document outputted, the procedure which detect the number of papers outputted from the this detected pagination, and the procedure change the approach of the directions about printing when the this detected number of papers is below the number of predetermined papers, in the printer driver which is carried in an information processor, controls the printer connected to this information processor, and outputs a printing document.

[Claim 2] The printer driver according to claim 1 characterized by said number of predetermined papers being one sheet.

[Claim 3] Modification of the approach of the directions about said printing is a printer driver according to claim 1 or 2 characterized by being modification to the approach of sending said printing document data for the number of predetermined papers after sending the copy directions for two or more sheets from the approach of sending said printing document data for the number of predetermined papers two or more times, when the detected number of papers is below the number of predetermined papers.

[Claim 4] Detection of said number of papers is a printer driver given in any 1 term to claims 1-3 characterized by being carried out based on the detected pagination, the existence of double-sided printing assignment of said printing document, and the layout information on a printing document.

[Claim 5] In the printer which is connected to an information processor, is controlled by the printer driver carried in this information processor, and outputs a printing document The procedure in which said printer driver detects the pagination of said printing document outputted, The printer characterized by having the procedure which detects the number of papers outputted from the detected this pagination, and the procedure of changing the approach of the directions about printing when the this detected number of papers is below the number of predetermined papers.

[Claim 6] In the printing system by which it has an information processor and a printer, it is controlled by the printer driver carried in said information processor, and said printer outputs a printing document The procedure in which said printer driver detects the pagination of said printing document outputted, The printing system characterized by having the procedure which detects the number of papers outputted from the detected this pagination, and the procedure of changing the approach of the directions about printing when the this detected number of papers is below the number of predetermined papers.

[Claim 7] The information processor characterized by to have the procedure in_ which of said printer driver detects the pagination of said printing document outputted, the procedure which detect the number of papers outputted from the this detected pagination, and the procedure change the approach of the directions about printing when the this detected number of papers is below the number of predetermined papers, in the information processor which carries a printer driver, controls a printer by this printer driver, and outputs a printing document.

[Claim 8] The printing approach characterized by to have the procedure in_ which of said printer driver detects the pagination of said printing document outputted, the procedure which detect the number of papers outputted from the this detected pagination, and the procedure change the approach of the

directions about printing when the this detected number of papers is below the number of predetermined papers, in the printing approach which prints a printing document by the printer controlled by the printer driver.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the printing approach which used a printer driver, a printer, a printing system, an information processor and the printing approach, the printer controlled by this printer driver by the printer driver list which is carried in an information processor, controls in a detail the printer connected to this information processor, and outputs a printing document, a printing system, an information processor, and this printer driver further.

[0002]

[Description of the Prior Art] When printing the document covering several pages in printing mode of processing it to be [what the section], after printing eye the one section to the last page, the so-called section unit printing which prints eye the two sections is known. Whether such section unit printing is performed outputs the data for number of copies to a printer by the printer driver side, in a user's setting up and performing section unit printing, when not performing section unit printing on the other hand, it outputs only some data to a printer side, and it is making the printer perform the copy of two or more sections by setting up the copy assignment by the side of a printer by number of copies.

[0003]

[Problem(s) to be Solved by the Invention] However, in the conventional printer control, although the number of printing documents was one, when section unit printing was set as the user setup of a printer driver, the printer driver outputted the data for number of copies to the printer, and the airline printer was performing data analysis processing for number of copies according to directions. The time loss of overlapping and performing this processing, since the processing time is needed for this analysis processing was large, and when performing printing processing, it was not efficient.

[0004] Thus, since it would not understand whether a printer driver should perform section unit printing by the printer driver side, or it should carry out by the copy function by the side of a printer but would be carried out according to a user setup, in unknown printing application, the problem that optimal printing processing could not be carried out had arisen, until the number of sheets of a printing document printed.

[0005] The technical problem of this invention is offering the printer driver which was made in order to solve the above-mentioned trouble, and can perform optimal printing processing according to the number of sheets (the number of papers) of a printing document, a printer, a printing system, an information processor, and the printing approach.

[0006]

[Means for Solving the Problem] In order to solve the above technical problem, it sets to this invention. In the printer driver which is carried in an information processor, controls the printer connected to this information processor, and outputs a printing document The configuration equipped with the procedure which detects the pagination of said printing document outputted, the procedure which detects the number of papers outputted from the this detected pagination, and the procedure of changing the approach of the directions about printing when the this detected number of papers is below the number

of predetermined papers is adopted.

[0007] With such a configuration, when the number of papers detected based on the pagination of the printing document outputted is below the number of predetermined papers, the approach of the directions about printing is changed. For example, it is changed into the approach of sending the printing document data for one sheet after sending the copy directions for two or more sheets from the approach of sending the printing document data for one sheet two or more times, when the number of predetermined papers is one sheet. Therefore, even if section unit printing is directed, when a printing document is below the number of predetermined papers, the printing document data only for the number of predetermined papers are outputted to a printer, and printing for number of copies is performed by the copy processing by the side of a printer. Therefore, compaction of the whole printing time amount can be aimed at.

[0008] The number of papers of a printing document is detected based on the detected pagination, the existence of double-sided printing assignment of a printing document, and the layout information on a printing document.

[0009] Moreover, in the printer which is connected to an information processor, is controlled by this invention by the printer driver carried in this information processor, and outputs a printing document, it is characterized by a printer driver having the above-mentioned configuration.

[0010] Furthermore, in the printing system by which it has an information processor and a printer, it is controlled by this invention by the printer driver carried in said information processor, and said printer outputs a printing document, it is characterized by a printer driver having the above-mentioned configuration.

[0011] Moreover, in this invention, it is characterized by a printer driver having the above-mentioned configuration in the information processor which carries a printer driver, controls a printer by this printer driver, and outputs a printing document.

[0012] Furthermore by this invention, it is characterized by a printer driver having the above-mentioned configuration in the printing approach which prints a printing document by the printer controlled by the printer driver.

[0013]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail based on the gestalt of operation shown in a drawing.

[0014] [Operation gestalt of ** 1st] drawing 1 is the block diagram showing the printing structure of a system to which the printer driver concerning the 1st operation gestalt was applied. In this drawing, it is the computer terminal which is shown with a sign 1, and this computer terminal 1 consists of memory 1b [which stores computer terminal CPU1a which manages the whole control, a program, and various data], indicating-equipment 1c, 1d [of hard disk units], dismountable disk drive 1e, and system clock 1f.

[0015] Moreover, the printer shown with a sign 2 consists of printing unit 2c [which performs printer CPU2a for printer control, expansion memory 2b, and printing], and receiving memory 2d. 3 shows a Centronics interface and a computer terminal 1 is connected with a printer 2 through Centronics interface 3.

[0016] A printer driver is read into memory 1b from on 1d of hard disk units, operates on the basis of control of CPU1a, and is changed into the printer language with which a printer 2 can interpret the data printing was instructed to be by printing application. This changed printer language is once spooled on 1d of fixed disks. At the time of printing, after being transmitted to a printer 2, storing print data in receiving memory 2d and being developed by the basis of control of printer CPU2a at image data, it is stored in expansion memory 2b and printing is performed by printing unit 2c.

[0017] Moreover, if copy number of sheets is directed by the printer driver which is operating on a computer terminal 1, a printer 2 will carry out the copy number-of-sheets partial output of the image data on expansion memory 2b to printing unit 2c, and will perform copy printing.

[0018] The printing manipulation routine performed by the printer driver which operates with a computer terminal 1 is illustrated in the form of a flow chart by drawing 2.

[0019] First, if there are directions of printing, in order to prepare printing by the printer, well-known initialization processing is performed. That is, internal **** page of the printer driver which memorizes all the pagination of a printing document is made into a value 0, and internal **** page_of_sheet of the printer driver which memorizes the pagination which constitutes one sheet of a printing document is initialized to a value 1 (step S201). Here, it becomes a value 2, when page_of_sheet means the printing pagination printed by per one sheet of print sheet, for example, 2 pages is printed per one sheet of print sheet like double-sided printing.

[0020] Next, the print data printing was instructed to be by printing application on the computer terminal 1 are changed into the printer language which can interpret a printer 2 (step S202).

[0021] When it distinguishes whether the data for 1 page were changed into printer language (step S203) and the data for 1 page are changed into printer language, an interior **** page [of a printer driver] value is incremented (step S204). After having not ended conversion of the printer language for 1 page by S203, when it is distinguished, in order to continue transform processing to the printer language for the page, it returns to step S202. The printer language changed at step S202 and step S203 is spooled to the file on 1d of hard disk units (step S205).

[0022] This processing is performed for every page and it distinguishes whether it changed into printer language about all pages (step S206). When creation processing is not completed about all pages, return and the above-mentioned processing are repeated to step S202. On the other hand, when processing is completed about all pages, it distinguishes whether a setup of a printer driver is section unit printing (step S207).

[0023] When it is judged at step S207 that section unit printing is set up, it judges whether double-sided printing is set up (step S208). If double-sided printing is set up, the value of interior **** page_of_sheet of a printer driver will be set as 2 (step S209).

[0024] Furthermore, the contents of a setting of layout printing are distinguished (step S210), if it is 2 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled two (step S211), and if it is 4 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled four (step S212). Here, the case where 2 inch 1 printing prints by arranging 2 pages to the print sheet of one sheet is said, and it says that 4 inch 1 printing arranges and prints 4 pages to the print sheet of one sheet.

[0025] Next, all printing number of sheets (the number of papers) is calculated by breaking an internal **** page [of a printer driver] value by the value of internal **** page_of_sheet of a printer driver (step S213). When a fraction comes out, below decimal point is revalued and it calculates as one sheet. For example, since the value of page_of_sheet is set to 2 in carrying out double-sided printing, 1/2 of the number of sheets of printing pagination turns into all printing number of sheets.

[0026] Here, all printing number of sheets distinguishes whether it is one sheet (step S214). When all printing number of sheets is two or more sheets when a value is not 1 namely, the printer language spooled on 1d of hard disk units is outputted to a printer 2 through number-of-copies batch Centronics interface 3 (step S215).

[0027] Only one batch outputs the printer language which section unit printing was not set up at step S207, or was spooled to the file on 1d of hard disk units on the other hand when printing number of sheets was a value 1 at step S214 to a printer 2 through Centronics interface 3 (step S216). If copy number of sheets is directed at step S216, the copy number-of-sheets partial output of the image data on expansion memory 2b will be carried out to printing unit 2c, and copy printing will be performed. That is, when there is a total of printing number of sheets of a, even if section unit printing is set up, only one batch will be outputted for the printer language spooled to the file on 1d of hard disk units to a printer 2, but need number of copies will be printed by copy processing of a printer.

[0028] The flow of processing by the printer driver concerning the 2nd operation gestalt is illustrated by [operation gestalt of ** 2nd] drawing 3. The printing structure of a system to which the printer driver of this operation gestalt is applied is the same as that of the thing of the 1st operation gestalt.

[0029] In drawing 3, first, like the 1st operation gestalt, interior **** page of a printer driver is initialized to a value 0, and interior **** page_of_sheet of a printer driver is initialized to a value 1 (step S301).

[0030] Next, it judges whether double-sided printing is set up (step S302), and if set up, the value of interior **** page_of_sheet of a printer driver will be set as 2 (step S303). Furthermore, the contents of a setting of layout printing are distinguished (SUPPU S304), if it is 2 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled two (step S305), and if it is 4 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled four (step S306).

[0031] Next, it distinguishes whether the data with which printing was directed were changed into the printer language which can interpret a printer 2 from printing application on the computer terminal 1 (step S307), and the data for 1 page were changed into printer language (step S308). When the data for 1 page are changed into printer language, an interior **** page [of a printer driver] value is incremented (step S309). After having not ended conversion of the printer language for 1 page at step S308, when it is distinguished, return and its conversion are continued to step S307.

[0032] After the increment of the page variable is carried out at the above-mentioned step S309, the printer language changed at step S307 is spooled to the file on 1d of hard disk units (step S310). Next, when it distinguishes whether all pages were changed into printer language (step S311) and is not changed into all page part printer language, return and the above-mentioned processing are repeated to step S307.

[0033] When all pages are judged to have been changed into printer language, it distinguishes whether a setup of a printer driver is section unit printing (step S312) and section unit printing is set up at step S311, interior **** page of a printer driver is compared with the value of interior **** page_of_sheet of a printer driver (step S313). Both variables are equal, or output the printer language of all the printing pages that set up copy number of copies using the copy number-of-sheets setting command, and were changed when all the printing pagination was smaller to a printer 2 through Centronics interface 3, and perform printing (step S314). Here, a printer 2 directed and carries out the copy number-of-sheets partial output of the image data on expansion memory 2b to printing unit 2c, and performs copy printing.

[0034] On the other hand, at step S313, when it is judged that all the printing pagination is larger, the number-of-copies time output of the printer language of all the changed printing pages is carried out through Centronics interface 3 at a printer 2, and printing is directed to a printer 2 (step S315).

[0035] In addition, when not set as section unit printing at step S312, it shifts to step S314 and the above-mentioned processing is performed.

[0036] In addition, in the above 1st and the 2nd operation gestalt, although connection between a printer driver and a printer was made through the Centronics interface, you may be serial interfaces, such as RS232C, and may be network connection like Ethernet.

[0037] Moreover, processing of 2 inch 1 printing or, and 4 inch 1 printing may be performed by the printer driver side, or you may carry out by the printer side.

[0038] Furthermore, when a computer terminal is connected with a printer through a bidirectional interface, capacity may be checked to a printer and you may judge whether this invention is processed by whether it has the section unit print facility by the printer side.

[0039] As long as the printer used for this invention has the copy print facility of a paper unit, they may be what kind of printers, such as a laser beam printer, an ink jet printer, a thermal transfer printer, and a dot impact printer.

[0040]

[Effect of the Invention] As mentioned above, by this invention, since the approach of the directions about printing is changed when the number of papers outputted is judged to be below the number of predetermined papers, also with unknown printing application, suitable printing directions can be performed according to the number of papers outputted, and printing processing can be raised until the pagination and the number of papers of a printing document print, so that clearly.

[0041] It is changed into the approach of sending the printing document data for one sheet after sending the copy directions for two or more sheets from the approach of sending the printing document data for one sheet two or more times, when the number of papers is below a predetermined value (for example, when the number of predetermined papers is one sheet). Therefore, since the printing document data only for the number of predetermined papers are outputted to a printer and printing for number of copies

is performed by the copy processing by the side of a printer even if section unit printing is directed, compaction of the whole printing processing time can be aimed at.

[0042] Moreover, since detection of the number of papers of a printing document is performed based on the detected pagination, the existence of double-sided printing assignment of a printing document, and the layout information on a printing document, it can detect the number of papers with an easy configuration.

[0043] Furthermore, by the printer, the printing system, information processor, and the printing approach of this invention, since the above-mentioned printer driver is adopted, the same outstanding operation effectiveness can be done so.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the printing approach which used a printer driver, a printer, a printing system, an information processor and the printing approach, the printer controlled by this printer driver by the printer driver list which is carried in an information processor, controls in a detail the printer connected to this information processor, and outputs a printing document, a printing system, an information processor, and this printer driver further.

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PRIOR ART

[Description of the Prior Art] When printing the document covering several pages in printing mode of processing it to be [what the section], after printing eye the one section to the last page, the so-called section unit printing which prints eye the two sections is known. Whether such section unit printing is performed outputs the data for number of copies to a printer by the printer driver side, in a user's setting up and performing section unit printing, when not performing section unit printing on the other hand, it outputs only some data to a printer side, and it is making the printer perform the copy of two or more sections by setting up the copy assignment by the side of a printer by number of copies.

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EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, by this invention, since the approach of the directions about printing is changed when the number of papers outputted is judged to be below the number of predetermined papers, also with unknown printing application, suitable printing directions can be performed according to the number of papers outputted, and printing processing can be raised until the pagination and the number of papers of a printing document print, so that clearly.

[0041] It is changed into the approach of sending the printing document data for one sheet after sending the copy directions for two or more sheets from the approach of sending the printing document data for one sheet two or more times, when the number of papers is below a predetermined value (for example, when the number of predetermined papers is one sheet). Therefore, since the printing document data only for the number of predetermined papers are outputted to a printer and printing for number of copies is performed by the copy processing by the side of a printer even if section unit printing is directed, compaction of the whole printing processing time can be aimed at.

[0042] Moreover, since detection of the number of papers of a printing document is performed based on the detected pagination, the existence of double-sided printing assignment of a printing document, and the layout information on a printing document, it can detect the number of papers with an easy configuration.

[0043] Furthermore, by the printer, the printing system, information processor, and the printing approach of this invention, since the above-mentioned printer driver is adopted, the same outstanding operation effectiveness can be done so.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the conventional printer control, although the number of printing documents was one, when section unit printing was set as the user setup of a printer driver, the printer driver outputted the data for number of copies to the printer, and the airline printer was performing data analysis processing for number of copies according to directions. The time loss of overlapping and performing this processing, since the processing time is needed for this analysis processing was large, and when performing printing processing, it was not efficient.

[0004] Thus, since it would not understand whether a printer driver should perform section unit printing by the printer driver side, or it should carry out by the copy function by the side of a printer but would be carried out according to a user setup, in unknown printing application, the problem that optimal printing processing could not be carried out had arisen, until the number of sheets of a printing document printed.

[0005] The technical problem of this invention is offering the printer driver which was made in order to solve the above-mentioned trouble, and can perform optimal printing processing according to the number of sheets (the number of papers) of a printing document, a printer, a printing system, an information processor, and the printing approach.

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MEANS

[Means for Solving the Problem] In order to solve the above technical problem, it sets to this invention. In the printer driver which is carried in an information processor, controls the printer connected to this information processor, and outputs a printing document. The configuration equipped with the procedure which detects the pagination of said printing document outputted, the procedure which detects the number of papers outputted from the this detected pagination, and the procedure of changing the approach of the directions about printing when the this detected number of papers is below the number of predetermined papers is adopted.

[0007] With such a configuration, when the number of papers detected based on the pagination of the printing document outputted is below the number of predetermined papers, the approach of the directions about printing is changed. For example, it is changed into the approach of sending the printing document data for one sheet after sending the copy directions for two or more sheets from the approach of sending the printing document data for one sheet two or more times, when the number of predetermined papers is one sheet. Therefore, even if section unit printing is directed, when a printing document is below the number of predetermined papers, the printing document data only for the number of predetermined papers are outputted to a printer, and printing for number of copies is performed by the copy processing by the side of a printer. Therefore, compaction of the whole printing time amount can be aimed at.

[0008] The number of papers of a printing document is detected based on the detected pagination, the existence of double-sided printing assignment of a printing document, and the layout information on a printing document.

[0009] Moreover, in the printer which is connected to an information processor, is controlled by this invention by the printer driver carried in this information processor, and outputs a printing document, it is characterized by a printer driver having the above-mentioned configuration.

[0010] Furthermore, in the printing system by which it has an information processor and a printer, it is controlled by this invention by the printer driver carried in said information processor, and said printer outputs a printing document, it is characterized by a printer driver having the above-mentioned configuration.

[0011] Moreover, in this invention, it is characterized by a printer driver having the above-mentioned configuration in the information processor which carries a printer driver, controls a printer by this printer driver, and outputs a printing document.

[0012] Furthermore by this invention, it is characterized by a printer driver having the above-mentioned configuration in the printing approach which prints a printing document by the printer controlled by the printer driver.

[0013]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail based on the gestalt of operation shown in a drawing.

[0014] [Operation gestalt of ** 1st] drawing 1 is the block diagram showing the printing structure of a system to which the printer driver concerning the 1st operation gestalt was applied. In this drawing, it is

the computer terminal which is shown with a sign 1, and this computer terminal 1 consists of memory 1b [which stores computer terminal CPU1a which manages the whole control, a program, and various data], indicating-equipment 1c, 1d [of hard disk units], dismountable disk drive 1e, and system clock 1f.

[0015] Moreover, the printer shown with a sign 2 consists of printing unit 2c [which performs printer CPU2a for printer control, expansion memory 2b, and printing], and receiving memory 2d. 3 shows a Centronics interface and a computer terminal 1 is connected with a printer 2 through Centronics interface 3.

[0016] A printer driver is read into memory 1b from on 1d of hard disk units, operates on the basis of control of CPU1a, and is changed into the printer language with which a printer 2 can interpret the data printing was instructed to be by printing application. This changed printer language is once spooled on 1d of fixed disks. At the time of printing, after being transmitted to a printer 2, storing print data in receiving memory 2d and being developed by the basis of control of printer CPU2a at image data, it is stored in expansion memory 2b and printing is performed by printing unit 2c.

[0017] Moreover, if copy number of sheets is directed by the printer driver which is operating on a computer terminal 1, a printer 2 will carry out the copy number-of-sheets partial output of the image data on expansion memory 2b to printing unit 2c, and will perform copy printing.

[0018] The printing manipulation routine performed by the printer driver which operates with a computer terminal 1 is illustrated in the form of a flow chart by drawing 2.

[0019] First, if there are directions of printing, in order to prepare printing by the printer, well-known initialization processing is performed. That is, internal **** page of the printer driver which memorizes all the pagination of a printing document is made into a value 0, and internal **** page_of_sheet of the printer driver which memorizes the pagination which constitutes one sheet of a printing document is initialized to a value 1 (step S201). Here, it becomes a value 2, when page_of_sheet means the printing pagination printed by per one sheet of print sheet, for example, 2 pages is printed per one sheet of print sheet like double-sided printing.

[0020] Next, the print data printing was instructed to be by printing application on the computer terminal 1 are changed into the printer language which can interpret a printer 2 (step S202).

[0021] When it distinguishes whether the data for 1 page were changed into printer language (step S203) and the data for 1 page are changed into printer language, an interior **** page [of a printer driver] value is incremented (step S204). After having not ended conversion of the printer language for 1 page by S203, when it is distinguished, in order to continue transform processing to the printer language for the page, it returns to step S202. The printer language changed at step S202 and step S203 is spooled to the file on 1d of hard disk units (step S205).

[0022] This processing is performed for every page and it distinguishes whether it changed into printer language about all pages (step S206). When creation processing is not completed about all pages, return and the above-mentioned processing are repeated to step S202. On the other hand, when processing is completed about all pages, it distinguishes whether a setup of a printer driver is section unit printing (step S207).

[0023] When it is judged at step S207 that section unit printing is set up, it judges whether double-sided printing is set up (step S208). If double-sided printing is set up, the value of interior **** page_of_sheet of a printer driver will be set as 2 (step S209).

[0024] Furthermore, the contents of a setting of layout printing are distinguished (step S210), if it is 2 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled two (step S211), and if it is 4 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled four (step S212). Here, the case where 2 inch 1 printing prints by arranging 2 pages to the print sheet of one sheet is said, and it says that 4 inch 1 printing arranges and prints 4 pages to the print sheet of one sheet.

[0025] Next, all printing number of sheets (the number of papers) is calculated by breaking an internal **** page [of a printer driver] value by the value of internal **** page_of_sheet of a printer driver (step S213). When a fraction comes out, below decimal point is revalued and it calculates as one sheet. For example, since the value of page_of_sheet is set to 2 in carrying out double-sided printing, 1/2 of the

number of sheets of printing pagination turns into all printing number of sheets.

[0026] Here, all printing number of sheets distinguishes whether it is one sheet (step S214). When all printing number of sheets is two or more sheets when a value is not 1 namely, the printer language spooled on 1d of hard disk units is outputted to a printer 2 through number-of-copies batch Centronics interface 3 (step S215).

[0027] Only one batch outputs the printer language which section unit printing was not set up at step S207, or was spooled to the file on 1d of hard disk units on the other hand when printing number of sheets was a value 1 at step S214 to a printer 2 through Centronics interface 3 (step S216). If copy number of sheets is directed at step S216, the copy number-of-sheets partial output of the image data on expansion memory 2b will be carried out to printing unit 2c, and copy printing will be performed. That is, when there is a total of printing number of sheets of a, even if section unit printing is set up, only one batch will be outputted for the printer language spooled to the file on 1d of hard disk units to a printer 2, but need number of copies will be printed by copy processing of a printer.

[0028] The flow of processing by the printer driver concerning the 2nd operation gestalt is illustrated by [operation gestalt of ** 2nd] drawing 3 . The printing structure of a system to which the printer driver of this operation gestalt is applied is the same as that of the thing of the 1st operation gestalt.

[0029] In drawing 3 , first, like the 1st operation gestalt, interior **** page of a printer driver is initialized to a value 0, and interior **** page_of_sheet of a printer driver is initialized to a value 1 (step S301).

[0030] Next, it judges whether double-sided printing is set up (step S302), and if set up, the value of interior **** page_of_sheet of a printer driver will be set as 2 (step S303). Furthermore, the contents of a setting of layout printing are distinguished (SUPPU S304), if it is 2 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled two (step S305), and if it is 4 inch 1 printing, the value of interior **** page_of_sheet of a printer driver is doubled four (step S306).

[0031] Next, it distinguishes whether the data with which printing was directed were changed into the printer language which can interpret a printer 2 from printing application on the computer terminal 1 (step S307), and the data for 1 page were changed into printer language (step S308). When the data for 1 page are changed into printer language, an interior **** page [of a printer driver] value is incremented (step S309). After having not ended conversion of the printer language for 1 page at step S308, when it is distinguished, return and its conversion are continued to step S307.

[0032] After the increment of the page variable is carried out at the above-mentioned step S309, the printer language changed at step S307 is spooled to the file on 1d of hard disk units (step S310). Next, when it distinguishes whether all pages were changed into printer language (step S311) and is not changed into all page part printer language, return and the above-mentioned processing are repeated to step S307.

[0033] When all pages are judged to have been changed into printer language, it distinguishes whether a setup of a printer driver is section unit printing (step S312) and section unit printing is set up at step S311, interior **** page of a printer driver is compared with the value of interior **** page_of_sheet of a printer driver (step S313). Both variables are equal, or output the printer language of all the printing pages that set up copy number of copies using the copy number-of-sheets setting command, and were changed when all the printing pagination was smaller to a printer 2 through Centronics interface 3, and perform printing (step S314). Here, a printer 2 directed and carries out the copy number-of-sheets partial output of the image data on expansion memory 2b to printing unit 2c, and performs copy printing.

[0034] On the other hand, at step S313, when it is judged that all the printing pagination is larger, the number-of-copies time output of the printer language of all the changed printing pages is carried out through Centronics interface 3 at a printer 2, and printing is directed to a printer 2 (step S315).

[0035] In addition, when not set as section unit printing at step S312, it shifts to step S314 and the above-mentioned processing is performed.

[0036] In addition, in the above 1st and the 2nd operation gestalt, although connection between a printer driver and a printer was made through the Centronics interface, you may be serial interfaces, such as RS232C, and may be network connection like Ethernet.

[0037] Moreover, processing of 2 inch 1 printing or, and 4 inch 1 printing may be performed by the printer driver side, or you may carry out by the printer side.

[0038] Furthermore, when a computer terminal is connected with a printer through a bidirectional interface, capacity may be checked to a printer and you may judge whether this invention is processed by whether it has the section unit print facility by the printer side.

[0039] As long as the printer used for this invention has the copy print facility of a paper unit, they may be what kind of printers, such as a laser beam printer, an ink jet printer, a thermal transfer printer, and a dot impact printer.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the printing structure of a system to which the printer driver was applied.

[Drawing 2] It is the flow chart which shows the printing manipulation routine performed by the printer driver concerning the 1st operation gestalt which operates with a computer terminal.

[Drawing 3] It is the flow chart which shows the printing manipulation routine performed by the printer driver concerning the 2nd operation gestalt which operates with a computer terminal.

[Description of Notations]

1 Computer Terminal

1a Computer terminal CPU

1b Memory

1c Display

1d Hard disk unit

1f System lock

2 Printer

2a Printer CPU

2b Expansion memory

2c Printing unit

2d Receiving memory

[Translation done.]

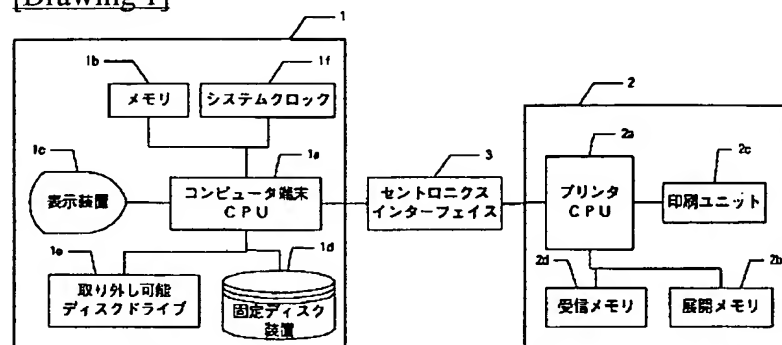
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DRAWINGS

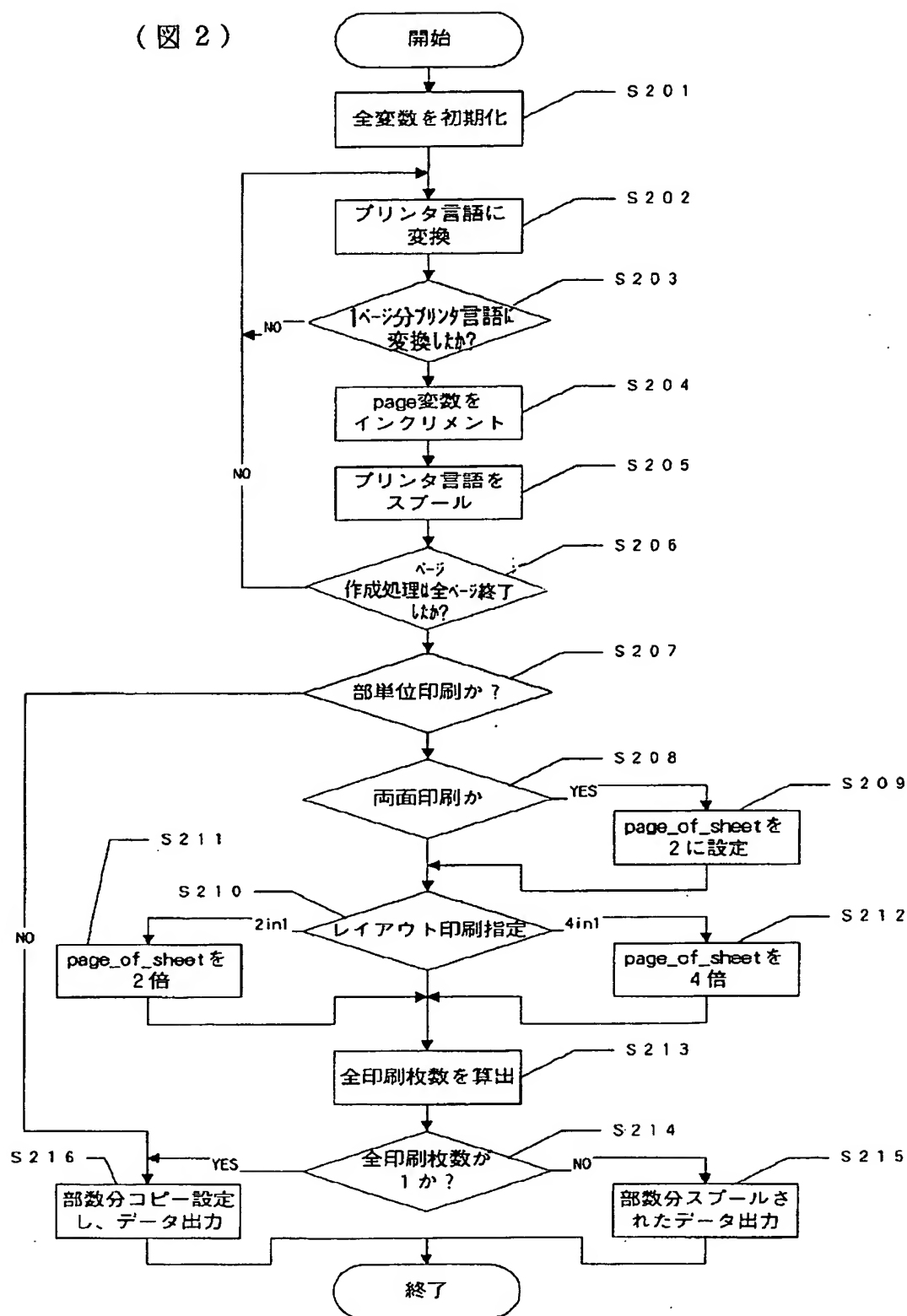
[Drawing 1]



(図 1)

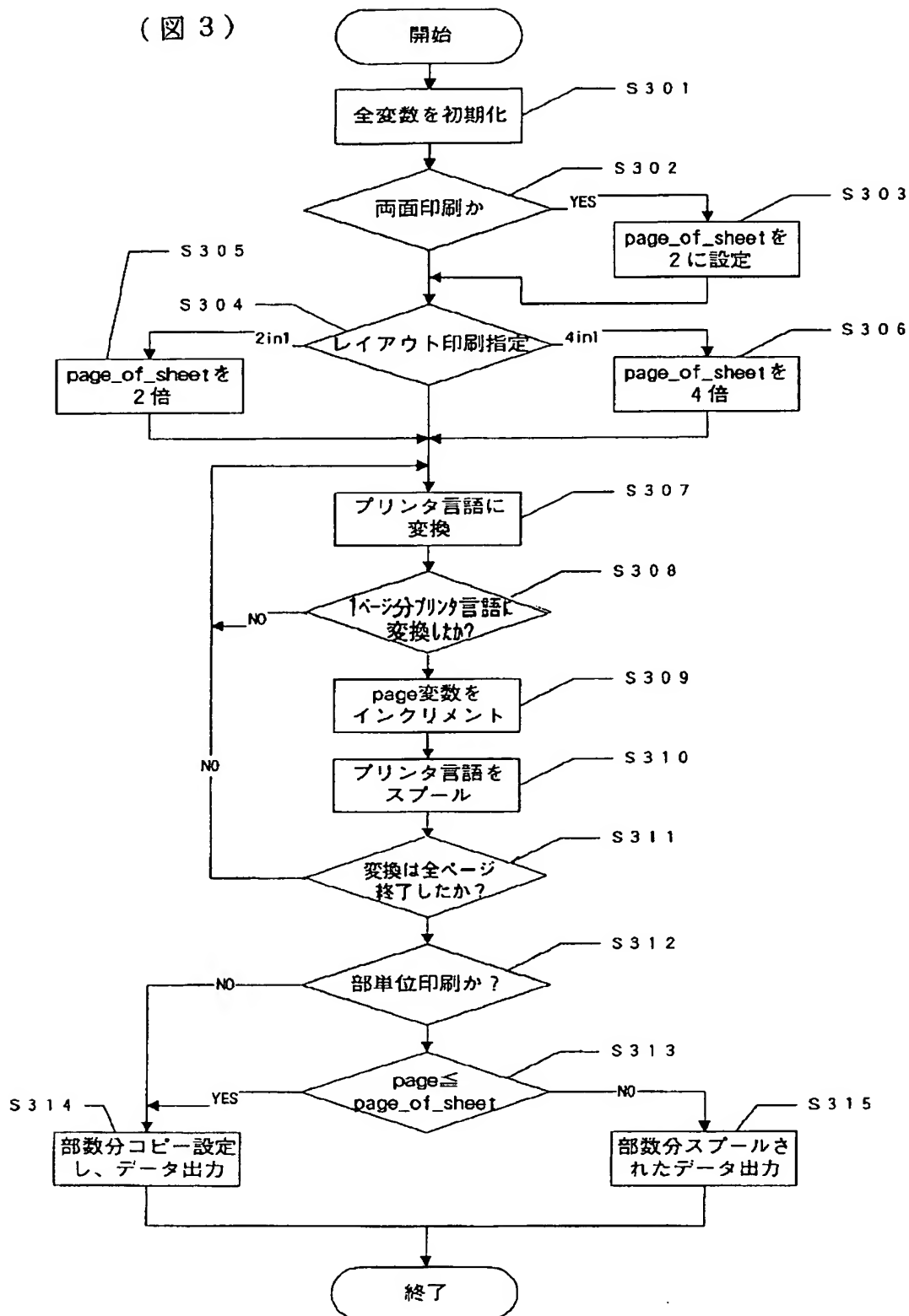
[Drawing 2]

(図 2)



[Drawing 3]

(図 3)



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CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
 [Section partition] The 4th partition of the 2nd section
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 [Application number] Japanese Patent Application No. 9-194692
 [The 7th edition of International Patent Classification]

B41J 5/30
 G06F 3/12

[FI]

B41J 5/30 Z
 G06F 3/12 P

[Procedure revision]
 [Filing Date] June 14, Heisei 13 (2001. 6.14)
 [Procedure amendment 1]
 [Document to be Amended] Specification
 [Item(s) to be Amended] Claim
 [Method of Amendment] Modification
 [Proposed Amendment]
 [Claim(s)]
 [Claim 1] In the printer driver which is carried in an information processor, controls the printer connected to this information processor, and outputs a printing document,
 The procedure which detects the pagination of said printing document outputted,
 The procedure which detects the number of papers outputted from the detected this pagination,
 The procedure of changing the approach of the directions about printing when the detected this number of papers is below the number of predetermined papers,
 The printer driver characterized by preparation *****.
 [Claim 2] The printer driver according to claim 1 characterized by said number of predetermined papers being one sheet.
 [Claim 3] Modification of the approach of the directions about said printing is a printer driver according to claim 1 or 2 characterized by being modification to the approach of sending said printing document data for the number of predetermined papers after sending the copy directions for two or more sheets from the approach of sending said printing document data for the number of predetermined papers two

or more times, when the detected number of papers is below the number of predetermined papers.

[Claim 4] Detection of said number of papers is a printer driver given in any 1 term to claims 1-3 characterized by being carried out based on the detected pagination, the existence of double-sided printing assignment of said printing document, and the layout information on a printing document.

[Claim 5] In the printer which is connected to an information processor, is controlled by the printer driver carried in this information processor, and outputs a printing document,

Said printer driver

The procedure which detects the pagination of said printing document outputted,

The procedure which detects the number of papers outputted from the detected this pagination,

The procedure of changing the approach of the directions about printing when the detected this number of papers is below the number of predetermined papers,

preparation ***** -- the printer characterized by things.

[Claim 6] In the printing system by which it has an information processor and a printer, it is controlled by the printer driver carried in said information processor, and said printer outputs a printing document,

Said printer driver

The procedure which detects the pagination of said printing document outputted,

The procedure which detects the number of papers outputted from the detected this pagination,

The procedure of changing the approach of the directions about printing when the detected this number of papers is below the number of predetermined papers,

preparation ***** -- the printing system characterized by things.

[Claim 7] In the information processor which carries a printer driver, controls a printer by this printer driver, and outputs a printing document,

Said printer driver

The procedure which detects the pagination of said printing document outputted,

The procedure which detects the number of papers outputted from the detected this pagination,

The procedure of changing the approach of the directions about printing when the detected this number of papers is below the number of predetermined papers,

preparation ***** -- the information processor characterized by things.

[Claim 8] In the printing approach which prints a printing document by the printer controlled by the printer driver,

Said printer driver

The procedure which detects the pagination of said printing document outputted,

The procedure which detects the number of papers outputted from the detected this pagination,

The procedure of changing the approach of the directions about printing when the detected this number of papers is below the number of predetermined papers,

preparation ***** -- the printing approach characterized by things.

[Claim 9] It is the printing approach for printing the printing document with which output number of copies was specified by the printer,

A judgment means to judge whether said printing document is outputted as how many sheets of form in said printer,

The selection process which chooses the 1st output step by which only the count corresponding to said output number of copies outputs said printing document to said printer, or the 2nd output step which outputs said printing document to said printer with the copy directions corresponding to said output number of copies based on said judgment result,

The printing approach characterized by preparation *****.

[Claim 10] It is the printing approach according to claim 9 which is further equipped with a means to specify double-sided printing, and is characterized by said judgment means judging form number of sheets based on whether assignment of double-sided printing is carried out to said printing document.

[Claim 11] It is the printing approach according to claim 9 or 10 which is further equipped with a means to specify layout printing which prints a document 2 pages or more as one side of one sheet of form, and is characterized by said judgment means judging form number of sheets based on whether assignment of

layout printing is further carried out to said printing document.

[Translation done.]